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Experience

USC / Information Sciences Institute (June 1992 – present)

Postel Center Director (Oct. 2000 – present)

Previously: Project Leader Oct. 1995 – Oct. 2000, Computer Scientist Jun. 1992 – Oct. 1995).

Coordinates visiting scholars, graduate scholarships, facilities, and funding. Participates in the LA DWP Smart Grid project, exploring the network architecture of a smart power grid. Participates in the NSF Engineering Research [Center for Integrated Access Networks \(CIAN\)](#), exploring optical Internet access network design. Ongoing research in Instant Infrastructure, and embedded personal Internet devices. Manages teams of 2-3 full-time researchers and 5-7 graduate students.

Former project leader of:

- NSF FIND [Recursive Internet Architecture \(RNA\)](#): a future Internet architecture
- DARPA [DynaSat](#): Internet overlays stack for distributed satellite clusters
- DARPA [POW](#) and [OCDMA](#): optical Internet WAN and LAN architectures.
- NSF [OptIPuter](#): high-speed security supporting optical high-performance computing.
- NSF [NetFS](#): a file system interface for network configuration.
- NSF [X-Tend](#): ongoing development of the X-Bone system for academic and research use.
- NSA Agile Tunnels ([ATP](#)): using floating tunnel links to avoid DDOS attacks.
- DARPA [ALN](#): using automated machine learning to tune transport protocols.
- DARPA [X-Bone](#) and [DynaBone](#): automated deployment and management of IP overlay networks and extensions for multilayer overlays to resist denial-of-service attacks.
- DARPA [Large-Scale Active Middleware](#): multicast web system for low-latency access.
- DARPA [ATOMIC-2](#): analyzed the performance of MD5 (code incorporated into Cisco IOS), developed a high-speed host gateway, designed dynamic routing for experimental LANs.
- DARPA [PC-ATOMIC](#): a high-speed i486 VL-bus interface for the ATOMIC LAN.

Previous other research participation at ISI included the redesign of the military Internet (TCA), and development of a user interface for ISI's *mmcc* teleconference tool, ported Bellcore's Touring Machine teleconferencing tool to NeXTs.

Research Associate Professor (CS Jun. 2002-present, EE courtesy/joint Jun. 2003-present)

Previously: CS Assistant Feb. 1994 – Jun. 2002.

Taught [CSCI555 Advanced Operating Systems](#) (Springs 1994-1996), [CSCI558L Internetworking and Distributed Systems Lab](#) (Summer 2001), developed ISI's [Summer Graduate Research Experience Program \(SGREP\)](#) (1999-2004), advised 19 students. USC Ambassador (2004 – present).

US Air Force (October 2006 – September 2010) IPA loan

SMC MCTG/Advanced Concepts Group Network Chief.

Advising the Space and Missile Center / Military Satellite Communications wing's Transformational Communications Satellite program (as Space Segment Sr. Network Engineer) and ACG on-site on networking issues.

Innocent Venture Capital (Nov. 2000 – May 2002)

Consultant.

Assessing the technological feasibility of Internet, networking, and distributed systems concepts.

Lehrman Group Council of Technology Advisors (Aug. 1999 – present)

Consultant.

Assessing the technological feasibility of Internet and networking concepts.

CTA / NASA Goddard Space Flight Center (Feb. 1992 – Jun. 1992)

Consultant.

Assessed the networking issues of the EOS Intelligent Database Management system.

Bell Communications Research (Jun. 1987 – Feb. 1988)

Resident Contractor, TSEP student.

Developed algorithms for flow control in multicast packet networks. Designed and implemented multistage packet switch simulation tools.

GTE Labs, Inc. (Summers 1983-84-85, Jan. 1986)

Consultant, IURP student.

Designed telephone graphic user interface hardware, high-speed switching systems, infrared protocols, and diffuse infrared data separators.

Education

University of Pennsylvania

Ph.D., May 1992, Computer and Information Science, Advisor: David J Farber, Dissertation Title: *Mirage: A Model for Latency in Communication*. supported by DARPA's Info. Science and Tech. Office, contract NAG-2-639 entitled "Mirage" and AT&T Grad. Research Fellowship #111349.

Cornell University

M.S., August 1987, Computer Science, Advisor: Ken Birman.

University of Scranton

B.S., May 1985, *Summa cum Laude* with Honors, Biophysics and Computer Science, Presidential I (full-tuition, 4-year) Scholarship, Award for Excellence in Computer Science.

Honor societies: [Alpha Sigma Nu](#) (general, Jesuit; secretary), [Sigma Pi Sigma](#) (physics), [Upsilon Pi Epsilon](#) (computer science; chapter founder), [Sigma Xi](#) (scientific research, Assoc. 1984, Full 1993).

Memberships

[ACM](#) (student 1983, member 1992, senior 2010, distinguished scientist 2010), [Sigcomm](#)
[IEEE](#) (student 1983, member 1992, senior 2002) [Comm. Society](#), [Computer Society](#)

Honors:

ACM Distinguished Scientist (2010), Senior member (2010)
DARPA FTN Award for Excellence in Academic Research (2003)
IEEE Senior member (2002)
PTI Technology Achievement Winner (work with Santa Monica's Public Electronic Network) (1996)
[Sigma Xi](#) (scientific research, Assoc. 1984, Full 1993)
USAF TSAT Space Segment Civilian Quarterly Award (1Q2007), Yearly Award (2007)

Funding

PI	DARPA	PC-ATOMIC	1994-1995 (1 year, \$340K)
PI	DARPA	ATOMIC-2	1994-1997 (4 years, \$2.1M)
Co-author, PI	DARPA	LSAM	1995-1998 (3 years, \$3M)
Author, PI	DARPA	X-Bone	1998-2001 (3 years, \$2.5M)
Author, PI	DARPA	DynaBone	2001-2004 (3 years, \$2M)
Author, PI	NSF	NetFS	2001-2006 (4.5 years, \$480K)
Author, PI	NSF	X-Tend	2002-2006 (3.5 years, \$500K)
Co-author, co-PI	DARPA	ALN	2005-2006 (1 year, \$400K)
Author, PI	NSA	Agile Tunnels	2005-2006 (1 year, \$75K)
Author, PI	NSF	RNA	2006-2012 (6 years, \$350K)
Author, PI	USAF	PROS	2006-2010 (4 years, \$1.4M)
Co-author, Co-PI	NSF ERC	CIAN	2008-present (5 years, \$100K/yr, current)
Author, PI	NSF	RNA-Suppl	2010-2012 (2 yrs, \$80K)
Author, PI	DARPA	DynaSat	2011 (0.5 yrs, \$850K)

Research Areas

[Virtual and overlay networks](#) (incl. multilayer overlays, application deployment)
[Optical network interfaces, switching architectures, and devices](#)
[High performance / zero configuration network security protocols](#)
Automated Internet configuration and deployment
High-speed protocols and networks and network architecture
Empirical protocol, algorithm, and system performance (esp. TCP performance)
Web cache design and performance (incl. multicast web caches)
Latency reduction (esp. reducing connection and transmission latencies, and the use of anticipation)

Professional Activities

Society/Organization Officer:

[ACM Sigcomm](#): Secretary/Treasurer 2002-2003, Conference Coordinator 2003-2007, Conference Coordinator Emeritus (2007-2011)

IANA Port Expert Review Team leader 2008-present

[IEEE Communications Society](#): [Internet TC](#) (co-chair 2000-2004), [TC on Gigabit Networking \(TCGN\)](#) (chair 1999-2001, vice-chair 1996-1999), [TC on Computer Communications \(TCCC\)](#) (chair 2008-present), [Director of Conference Operations](#) (2012-present)

IETF Directorate member: Transport (2008-present), SmartPower (2011-present)

IRSG member 2010-present

[IRTF Virtual Networks Research Group](#) co-creator, chair 2010-present

Editorial Board member:

Elsevier's Journal of Computer and Systems Sciences 2007-present

Elsevier's Computer Networks (and ISDN Systems, formerly) 1999-2006

IEEE Network 1997-present

Conference Steering Committees:

ACM Sigcomm Conext ReArch Steering Committee 2008-present

Global Future Internet Summit 2011-present

IARIA Int'l Conf. on Internet Surveillance & Protection (ICISP) Advisory Committee 2006

IEEE FutureNet Steering Committee 2011-present

IEEE Infocom Standing Committee 2005-present

IEEE Global Internet Steering Committee 2000-present (Chair)

IEEE Workshop on Internet Applications Steering Committee 1999-2005

Conference Leadership:

ACM Sigcomm (Publicity Chair 2000, Finance Chair 2001, Registration/Finance Chair 2012)

ACM Sigcomm CoNext ReArch Workshop (Chair 2008)

AsiaFI Conference on Future Internet (CFI) (Tech. Co-Chair 2011, Co-Chair 2012)

IEEE Computer Communications Workshop (Finance Chair 2009, Chair 2010)

IEEE ICCCN Future Internet Arch. and Protocols 2008, Network Arch. and Protocols 2009 (Chair)

IEEE Global Internet Workshop 1996-1999, 2001-2006, 2008-present (Chair 2005)

IEEE Infocom 1994-2003, 2005-present (Internet Co-chair 1999, TPC Chair 2006)

IEEE ICC FutureNet IV 2011 (Chair)

IEEE High-Speed (fmr. Gigabit) Netw. Workshop 1996-present (CoChair 1997, 1999; Chair 1998)

IFIP Protocols for High-Speed Networks 1994-2002 (Co-chair 1999)

Optical Internet Workshop 1997 (Chair)

SPIE Opticomm 2001 (Vice General Chair)

Conference Conference/Workshop Technical Program Committees:

ACM Sigcomm Asia Workshop 2005
ACM Dynamic Interconnection of Networks Workshop (at Mobicom) 2005
Asia Internet Engineering Conference (AINTEC) 2012
Conference on Comm. Systems and Networks (COMSNETS) 2012
ENext CoNext Workshop 2006-2007
IARIA Int'l Conf. on Internet Surveillance & Protection (ICISP) 2006
IEEE Conference on High Speed Networks 1999, 2000
IEEE Conference on Networks for Grid Applications (GridNets) 2007
IEEE ICC (was Globecom) FutureNet Workshop 2009-present
IEEE Infocom Works in Progress 2010
IEEE International Conference on Network Protocols (ICNP) 2002-2003, 2005-2006
IEEE Openarch 2002-2003
IEEE Network Storage Symposium 1999
IEEE Symposium on Internet Services and Enabling Technologies (ISET) 2006
IEEE Workshop on Computer Communications 1997
IEEE Workshop on Internet Applications 1999-2001
IEEE Workshop on Long-Delay Broadband Networks 1997
OSA Photonics in Switching 2012
Physics of Computation Workshop 1994
Protocols for Future, Large-Scale and Diverse Network Transports (PFLDNeT) 2009-present

Internal Activities

USC Ambassador (2005-present)
USC Faculty Senate Committee on Non-Tenure-Track Faculty Affairs (CNTTFA) (2011-present)

Publications

Patents

Received:

J. Touch, Y. Wang, L. Eggert, "Routable Network Subnet Relocation System and Methods," U.S. Patent # [7,653,746](#), University of Southern California, Aug. 2002 (granted Jan. 26, 2010).

P. V. Kumar, R. Omrani, J. Touch, A. Willner, P. Saghari, "Code cycle modulation in optical code division multiple access systems," U.S. Patent # [7,616,618](#), Univ. of Southern California, Nov. 2005 (granted Nov. 10, 2009).

J. Bannister, J. Touch, P. Kamath, A. Patel, J. McGeehan, A. Willner, "A Method to Forward Internet Packets Without Conversion from an Optical to an Electronic Format," U.S. Patent # [7,369,766](#), University of Southern California, Sept. 2001 (granted May 6, 2008).

J. Touch, D. Farber, "Memory-side driven anticipatory instruction transfer interface with processor-side instruction selection," U.S. Patent # [5,353,419](#), Univ. of Penn., Sept. 1991 (granted Oct. 4, 1994).

Pending:

J. Touch, J. Bannister, S. Suryaputra, "Packet Switch with Separate Look Ahead, Computation, and Shift Phases," U.S. Patent Application 12/845,616, Univ. of Southern California, Aug. 2010. (patent pending).

J. Touch, Y. Wang, L. Eggert, "Cooperative Network Boundary Traversal," U.S. Patent Disclosure, University of Southern California, Dec. 2003.

Books/Special Issues/Published Tutorials

J. Quittek, J. Touch, "[Recent Advances in IETF Standards](#)," Special Issue, *IEEE Network*, Apr. 2011 V49 N4, pp. 76-77.

J. Touch, "[Components developed for all-optical Internet router](#)," SPIE Newsroom article (PDF also available), Sept. 24, 2008.

A. Azcorra, J. Touch, Z. Zhang, "[Selected Papers on Wireless and Mobility from IEEE INFOCOM](#)," *IEEE Transactions on Mobile Computing*, V6, N6, June 2007, pp. 577-578.

K. Kobayashi, P. Vicat-Blanc, J. Touch, Guest Editors, [Special Issue on the Protocols for Fast, Long-Distance Networks](#), *Computer Networks*, V51 I7, 2007, pp. 1745-1747.

J. Touch, "Virtual and Overlay Networks," IEEE Tutorials Now, 2005.

J. Touch, "Overlay Networks," Chapter in *Practical Handbook of Internet Computing*, ed. M. P. Singh, CRC Press, Sept. 2004, ISBN 1-58488-381-2.

M. Hofman, R. Kravets, J. Touch, Guest Editors, [Special Issue on the Global Internet](#), *Computer Networks*, V45 I1, 2004, pp. 1-3.

J. Touch and J. Postel, "Network Infrastructure," Chapter in *The Grid 2: Blueprint for a New Computing Infrastructure*, ed. I. Foster and C. Kesselman, Morgan Kaufmann/Elsevier, Nov. 2003, ISBN 1-55860-933-4.

J. Touch, Guest Editor, [Special Issue on Overlay Networks](#), *Computer Networks*, V36 I2-3, July 2001.

- J. Bannister, J. Senior, and J. Touch (eds.), *OptiComm 2001: Optical Networking and Communications*, Proceedings of the SPIE Vol. 4599, 2001.
- J. Sterbenz and J. Touch, *High Speed Networking: A Systematic Approach to High-Bandwidth Low-Latency Communication*, Wiley, 2001.
- J. Touch and J. Sterbenz (eds.), *Protocols for High Speed Networks VI*, Kluwer, 1999.
- J. Postel and J. Touch, "Network Infrastructure," chapter in *Computational Grids: The Future of High-Performance Distributed Computing*, ed. I. Foster and C. Kesselman, Morgan Kaufmann, Aug. 1998, ISBN 1-55860-475-8.
- J. Touch, *Mirage: A Model for Latency in Communication*, Ph.D. Dissertation, Univ. of Pennsylvania, Dept. of Computer and Information Science (CIS) Tech. Report MS-CIS-92-42, DSL-11, Jan. 1992.

Refereed Journals

- J. Touch, I. Baldine, R. Dutta., G. Finn, B. Ford, S. Jordan, D. Massey, A. Matta., C. Papadopoulos, P. Reiher, G. Rouskas, "[A Dynamic Recursive Unified Internet Design \(DRUID\)](#)". *Computer Networks*, V55 N4, Mar. 2011, pp. 919–935. [A local copy is available here.](#)
- R. Van Meter, J. Touch, C. Horsman, "[Recursive Quantum Repeater Networks](#)," *Progress in Informatics*, N8, Mar. 2011, pp 65-79.
- P. Saghari, P. Kamath, V. Arbab, M. Haghi, A. Willner, J. Bannister, J. Touch, "[Experimental Demonstration of Interference Avoidance Protocol \(Transmission Scheduling\) for O-CDMA Networks](#)," *Optics Express Journal*, V15 N25, pp. 16442-16447, Dec. 2007.
- N. Fujita, J. Touch, V. Pingali, Y. Wang, "[A Dynamic Topology and Routing Management Strategy for Virtual IP Networks](#)," *IEICE Trans. on Communications*, VE89-B, N9, Sept. 2006, pp. 2375-2384.
- K. Merchant, J. McGeehan, A. Willner, S. Ovadia, P. Kamath, J. Touch, J., Bannister, "[Analysis of an Optical Burst Switching Router with Tunable Multiwavelength Recirculating Buffers](#)," *IEEE/OSA Journal of Lightwave Technology*, V23, N10, Oct. 2005, pp. 3302-3312.
- M. Hauer, J. McGeehan, S. Kumar, J. Touch, J. Bannister, E. Lyons, C. Lin, A. Lau, H. Lee, D. Starodubov, & A. Willner, "[Optically-Assisted Internet Routing Using Arrays of Novel Dynamically Reconfigurable FBG-Based Correlators](#)," *IEEE/OSA Journal of Lightwave Technology*, Special Issue on Optical Networks, V21 N11, Dec. 2003, pp. 2765-2778.
- J. McGeehan, S. Kumar, D. Gurkan, S. Motaghian Nezam, J. Bannister, J. Touch, & A. Willner "[All-Optical Decrementing of a Packet's Time-To-Live \(TTL\) Field and Subsequent Dropping of a Zero-TTL Packet](#)," *IEEE/OSA Journal of Lightwave Technology*, Special Issue on Optical Networks, V21 N11, Dec. 2003, pp. 2746-2752.
- J. Touch, "Those Pesky NATs," *IEEE Internet Computing*, July/Aug. 2002, pp. 96. Original version in [PDF](#); a cached copy of the extended online version is available in [HTML](#) or [PDF](#).
- J. Touch, "[Dynamic Internet Overlay Deployment and Management Using the X-Bone](#)," *Computer Networks*, July 2001, pp. 117-135. A [previous version](#) appeared in Proc. ICNP 2000, pp. 59-68.
- J. Bannister, J. Touch, A. Willner, S. Suryaputra, "[How Many Wavelengths Do We Really Need? A Study of the Performance Limits of Packets over Wavelengths](#)" *Optical Networks*, April 2000, pp. 17-28.

- L. Eggert, J. Heidemann, J. Touch, “[Effects of Ensemble TCP](#),” *ACM Computer Communications Review (CCR)*, Jan. 2000, pp. 15-29.
- J. Touch and A. S. Hughes, “[The LSAM Proxy Cache - a Multicast Distributed Virtual Cache](#),” *Computer Networks and ISDN Systems*, V30 N22-23, Nov. 25, 1998, pp. 2245-2252.
- S. Walton, A. Hutton, and J. Touch, “[High-Speed Data Paths in Host-Based Routers](#),” *IEEE Computer*, Nov. 1998, pp. 46-52. An earlier version appeared at the LANMAN Workshop in 1998.
- J. Heidemann, K. Obraczka, J. Touch, “[Modeling the Performance of HTTP Over Several Transport Protocols](#),” *IEEE/ACM Transactions on Networking*, V5, N5, Oct. 1997, pp.616-630.
- J. Sterbenz, H. Schulzrinne, J. Touch, “[Report and Discussion on the IEEE ComSoc TCGN Gigabit Networking Workshop 1995](#),” *IEEE Network*, July 1995, pp.9-21.
- J. Touch, “[Defining ‘High Speed’ Protocols: Five Challenges & an Example That Survives the Challenges](#),” in *IEEE Journal on Selected Areas of Communications (JSAC)*, Spec. Issue on Applications Enabling Gigabit Networks, Vol. 13, No. 5, June 1995, pp. 828-835. Available as [ISI RS-95-408](#).
- J. Touch, D. Farber, “[Reducing Latency in Communication](#),” Letter to the editor *IEEE Communications Magazine*, Vol. 31, No. 2, Feb. 1993, pp. 8-9.
- J. Touch, “[Telecom. Issues of Intelligent Database Mgt. for Ground Proc. Systems in the EOS Era](#),” *Telematics and Informatics*, Vol 11 No. 4, 1994, pp. 319-332. Available is [ISI RS-95-404](#).

RFCs:

- M. Cotton, L. Eggert, J. Touch, M. Westerlund, S. Cheshire “[Internet Assigned Numbers Authority \(IANA\) Procedures for the Management of the Transport Protocol Port Number and Service Name Registry](#),” RFC 6335 / BCP 165, Aug. 2011.
- J. Touch, A. Mankin, R. Bonica, “[A TCP Authentication Option](#),” RFC 5925, Jun. 2010.
- J. Touch, “[Version 2.0 Microsoft Word Template for Creating Internet Drafts and RFCs](#),” RFC 5385, Feb. 2010.
- J. Touch, R. Perlman, “[Transparently Interconnecting Lots of Links \(TRILL\): Problem and Applicability Statement](#),” RFC 5556, May 2009.
- J. Touch, D. Black, Y. Wang, “[Problem and Applicability Statement for Better Than Nothing Security \(BTNS\)](#),” RFC 5387, Nov. 2008.
- J. Touch, “[Defending TCP Against Spoofing Attacks](#),” RFC 4953, July 2007.
- J. Touch, L. Eggert, Y. Wang, “[Use of IPsec Transport Mode for Dynamic Routing](#),” RFC 3884, Sept. 2004.
- P.Karn, (ed.), C. Bormann, G.Fairhurst, D. Grossman, R. Ludwig, J. Mahdavi, G. Montenegro, J. Touch, L. Wood, “[Advice for Internet Subnetwork Designers](#),” RFC 3819 / BCP 89, July 2004.
- M. Allman (ed.), S. Dawkins, D. Glover, J. Griner, T. Henderson, J. Heidemann, J. Touch, H. Kruse, S. Ostermann, K. Scott, J. Semke, “[Ongoing TCP Research Related to Satellites](#),” RFC 2760, Feb. 2000.
- J. Touch, “[TCP Control Block Interdependence](#),” RFC 2140, April 1997.
- J. Touch, B. Parham, “[Implementing the Internet Checksum in Hardware](#),” RFC 1936, April 1996.
- J. Touch, “[Report on MD5 Performance](#),” RFC 1810, June 1995.

Refereed Conferences:

- S. Suryaputra, J. Touch, J. Bannister, "[The Case of a Precognition Optical Packet Switch](#)," Proc. IEEE High-Speed Networks Workshop, Apr. 2009.
- S. Adachi, Y. Zambre, J. Pulliam, J. Haines, M. Everett, J. Touch, V. Mehta, "[Network Management Approach For The TSAT Network](#)," Proc. IEEE Milcom, Oct. 2008.
- J. Pulliam, Y. Zambre, A. Karmarkar, V. Mehta, J. Touch, J. Haines, M. Everett, "[TSAT Network Architecture](#)," Proc. IEEE Milcom, Oct. 2008.
- J. Jacobson, Y. Zambre, J. Pulliam, J. Touch, M. Everett, J. Haines, V. Mehta, "Network Security Architecture and Mechanisms in the TSAT System," Proc. IEEE Milcom, Oct. 2008.
- J. Touch, V. Pingali, "[The RNA Metaprotocol](#)," Proc. IEEE International Conf. on Computer Comm. (ICCCN), Aug. 2008.
- E. Yang, J. Touch, "[Protocol Family for Optimal and Deterministic Symmetric Key Assignment](#)," Proc. Int'l Conf. on Networking (ICN), April 2008, Cancun, Mexico.
- P. Kumar, R. Omrani, J. Touch, A. Willner, P. Saghari, "[A Novel Optical CDMA Modulation Scheme: Code Cycle Modulation](#)," Proc. IEEE Globecom, Nov. 2006.
- V. Pingali, J. Touch, "[Protecting Public Servers from DDoS Attacks Using Drifting Overlays](#)," Proc. IEEE / IST Workshop on Monitoring, Attack Detection and Mitigation (MonAM), Nov. 2006.
- J. Touch, Y. Yang, "[Reducing the Impact of DoS Attacks on Endpoint IP Security](#)," Proc. NPSec 2006, in conjunction with ICNP 2006, Nov. 2006.
- P. Saghari, P. Kamath, V. Arbab, M. Haghi, A. Willner, J. Bannister, J. Touch, "[Experimental Demonstration of an Interference-Avoidance-Based Protocol for O-CDMA Networks](#)," Proc. OFC 2006, Mar. 2006.
- P. Kumar, R. Omrani, J. Touch, A. Willner, P. Saghari, "[Three-Fold Increase in Number of Active Users in an O-CDMA System Using Novel Code-Cycle Modulation](#)," Proc. OFC 2005, Mar. 2005.
- L. Eggert, J. Touch, "[Idle-time Scheduling with Preemption Intervals](#)," Proc. Symposium on OS Principles (SOSP) 2005, pp. 249-262.
- J. Touch, Y. Wang, V. Pingali, L. Eggert, R. Zhou, G. Finn, "[A Global X-Bone for Network Experiments](#)," Proc. IEEE Tridentcom 2005, Trento Italy, Feb. 2005, pp. 194-203.
- K. Merchant, J. McGeehan, A. Willner, S. Ovadia, P. Kamath, J. Touch, J. Bannister, "[Performance Evaluation of a Router with Tunable Recirculating Buffers in an Optical Burst Switching Environment](#)," Proc. Broadnets 2004, San Jose, CA, Oct. 2004.
- P. Kamath, J. D. Touch, J. A. Bannister, "[Algorithms for Interference Sensing in Optical CDMA Networks](#)," Proc. IEEE International Conference on Communications (ICC), Paris, June 2004, pp. 1720-1724.
- P. Kamath, J. Touch, J. Bannister, "[The Need for Media Access Control in Optical CDMA Networks](#)," Proc. Infocom 2004.
- J. Touch, V. Pingali, "[DataRouter: A Network-Layer Service for Application-Layer Forwarding](#)," Proc. International Workshop on Active Networks (IWAN), Osaka, Springer-Verlag, December 2003.

- J. Touch, G. Finn, Y. Wang, L. Eggert, “[DynaBone: Dynamic Defense Using Multi-layer Internet Overlays](#),” Proc. 3rd DARPA Information Survivability Conference and Exposition (DISCEX-III), Washington, DC, USA, April 22-24, 2003, Vol. 2, pp. 271-276.
- J. Touch, L. Eggert, Y. Wang, “[TetherNet Anti-NAT - Secure Internet Subnet Rental System](#),” Proc. 3rd DARPA Information Survivability Conference and Exposition (DISCEX-III), Washington, DC, USA, April 22-24, 2003, Vol. 2, pp. 112-114.
- D. Gurkan, S. Kumar, A. Sahin, A. Willner, K. Parameswaran, M. Fejer, D. Starodubov, J. Bannister, P. Kamath, J. Touch, “[All-Optical Wavelength and Time 2-D Code Converter for Dynamically-Reconfigurable OCDMA Networks Using a PPLN Waveguide](#),” Proc. Optical Fiber Communication Conference (OFC), Atlanta, Mar. 23-28, 2003, pp. 9-11.
- J. McGeehan, S. Kumar, A. Willner, J. Bannister, J. Touch, “[Optical Time-to-Live Decrementing and Subsequent Dropping of an Optical Packet](#),” Proc. Optical Fiber Communication Conference (OFC), Atlanta, Mar. 23-28, 2003, pp. 8-10.
- P. Kamath, K. C. Lan, J. Heidemann, J. Touch, J. Bannister, “[Generation of High-Bandwidth Traffic Traces](#),” Proc. MASCOTS, 10th International Symposium on Modeling, Analysis and Simulation of Computer and Telecommunication Systems, Texas, Oct. 2002.
- Y. Wang, J. Touch, “[Application Deployment in Virtual Networks Using the X-Bone](#),” Proc. DANCE: DARPA Active Networks Conference & Exposition, IEEE Computer Society Press, May 2002, pp. 484-493.
- M. Hauer, J. McGeehan, J. Touch, P. Kamath, J. Bannister, E. Lyons, C. Lin, A. Au, H. Lee, D. Starodubov, and A. Willner, “[Dynamically Reconfigurable All-Optical Correlators to Support Ultra-fast Internet Routing](#),” Proc. Optical Fiber Communications Conference (OFC), March 2002.
- J. Bannister, J. Touch, P. Kamath, A. Patel, “[An Optical Booster for Internet Routers](#),” Invited Paper, Proc. Eighth International Conference on High Performance Computing, Hyderabad, India, Dec. 2001, pp. 339-413.
- O. Ardaiz Villanueva, J. Touch, “[Web Service Deployment Using the X-Bone](#),” Proc. SEID 2000.
- S. Suryaputra, J. Touch, J. Bannister, “[Simple Wavelength Assignment Protocol](#),” in *Terabit Optical Networking: Architecture, Control, and Management Issues*, John M. Senior, Sudhir Dixit, Chunming Qiao, Editors, Proceeding of SPIE Vol. 4213, pp. 220-233 (2000) (Proc. Photonics East). A [previous version](#) appeared as an ISI Technical report, TR-99-473, October 1999.
- J. Bannister, J. Touch, A. Willner, S. Suryaputra, “[How Many Wavelengths Do We Really Need in an Internet Optical Backbone?](#)” in *Protocols for High-Speed Networks VI*, eds. J. Touch and J. Sterbenz, Kluwer, 1999.
- A. S. Hughes and J. Touch, “[Cross-Domain Cache Cooperation for Small Clients](#),” in *Proc. Network Storage Symposium (NetStore) 1999*, Seattle, WA.
- G. Finn, J. Touch, “[The Personal Node](#),” in *Proc. USENIX '99 Workshop on Embedded Systems*, 1999, pp. 1-7.
- T. Faber, J. Touch, and W. Yue, “[The TIME-WAIT state in TCP and Its Effect on Busy Servers](#),” in *Proc. IEEE Infocom*, 1999, pp. 1573-1583.
- J. Touch, S. Hotz, “[The X-Bone](#),” in *Proc. Third Global Internet Mini-Conference*, Proc. Globecom '98, Sydney, Australia Nov. 1998.

- S. Walton, A. Hutton, J. Touch, “[High Performance IP Forwarding Using Host Interface Peering](#),” (extended abstract) in *Proc. 9th IEEE Workshop on Local and Metropolitan Area Networks (LANMAN)*, Banff, Alberta, Canada, May 17-20, 1998
- J. Touch, T. Faber, “[Dynamic Host Routing for Production Use of Developmental Networks](#),” in *Proc. ICNP '97*, Atlanta, Oct. 1997, pp. 285-292.
- B. Kwan, P. Hu, N. Bambos, L. Kleinrock, J. Touch, H. Xu, “[Best-Effort Bandwidth Reservation in High Speed LANs using Wormhole Routing](#),” in *Proc. Int'l. Conf. on Comp. Comm. & Networks '96*, Wash. D.C.
- J. Touch, “[Performance Analysis of MD5](#),” in *Proc. ACM Sigcomm '95*, pp. 77-86.
- J. Touch, “[Protocol Parallelization](#),” in *Protocols for High Speed Networks IV*, Ed. G. Neufeld and M. Ito, Chapman and Hall, London, 1995, pp. 349-360.
- J. Touch, D. Farber, “[An Experiment in Latency Reduction](#),” in *Proc. IEEE Infocom*, June 1994, pp. 175-181.
- J. Touch, “[Parallel Communication](#),” in *Proc. IEEE Infocom*, Mar. 1993, pp. 506-512.
- J. Touch, “[Physics Analogs in Communications Models](#),” in *Proc. Workshop on Physics and Computation, Physcomp '92*, Oct. 1992, pp. 248-252.
- J. Touch, D. Farber, “[Mirage: A Model for Ultra High-Speed Protocol Analysis and Design](#),” in *Protocols for High-Speed Networks*, Ed. J. Rudin and R. Williamson, North-Holland, Amsterdam, 1989, pp. 115-133.
- K. Birman, J. Touch, “[An Experimental ECG Scanning System](#),” (extended abstract) in *Proc. of the Ninth Annual Conf. of the IEEE Engineering in Medicine and Biology*, Boston, Nov. 13-16, 1987.
- J. Touch, “[Experiments in Flat-Glass Cutting Optimization](#),” in *Proc. Symposium on the Complexity of Approximately Solved Problems*, at Columbia University, NY, Apr. 1985.

Other Conferences:

- J. Touch, “Future Directions & Metrics in Aggregation Networks”, OIDA Optical Data Comms Workshop, panel chair, Oct. 2011.
- M. Orosz, P. Marshall, G. Roesler, T. Kichkaylo, T. Ryutov, J. Touch, B Berckerik-Gerber, C. Fern, “Behavior Driven Building Energy Management System,” SERDP/ESTCP Partners in Environmental Technology Technical Symposium & Workshop poster, Nov. 2011.
- J. Touch, Panel Chair, “The Transport Tussle,” PFLDNet 2010, Lancaster, PA, Nov. 2010.
- J. Touch, “[Recursion and the Transport Tussle](#)”, PFLDNet 2010, Lancaster, PA, Nov. 2010.
- S. Suryaputra, J. Touch, J. Bannister, “[Lookahead Forward Shift Optical Packet Switch](#),” Proc. IEEE Infocom Student Poster Session, Mar. 2010.
- J. Touch, “[From Shannon to Recursive Nets: Multihop/Multiparty Influences on Network Architecture](#),” IEEE Computer Communications Workshop (CCW), Lenox, MA, Oct. 2009.
- J. Touch, “[Next Steps in Enabling A Virtual Internet](#),” IEEE Computer Communications Workshop (CCW), Lenox, MA, Oct. 2009.
- V. Pingali, J. Touch, “[Dynamic Network Renaming using Space-Time Contexts](#),” (extended abstract and poster), Proc. IEEE Infocom 2007 Student Poster Session, May 2007

- J. Touch, "[Recursive Network Architecture](#)," IEEE Workshop on Computer Communications (CCW), Pittsburgh PA, Feb. 2007.
- Y. Wang, J. Touch, J. Sylvester, "[Adding Selection into Protocol Stacks – Communication with Choices](#)," (ext. abstract, [poster](#)), Proc. IEEE ICNP Student Poster Session, Nov. 2006.
- P. Galiotos, J. Touch, J. Train, "[NetFS-Network Configuration Through the File System](#)," ICNP 2005 student poster.
- J. Touch, "[OCS: An Open Communicating System](#)," IEEE Workshop on Computer Communications (CCW), Irvine, CA, Oct. 2005.
- J. Touch, "[The Need for a ‘Communicating System’](#)," (white paper), NSF Workshop on Grand Challenges in Distributed Systems, Cambridge, MA, Sept. 29-30, 2005.
- J. Touch, Y. Wang, V. Pingali, L. Eggert, R. Zhou, G. Finn, "[A Global X-Bone for Network Experiments](#)," (extended abstract), Proc. IEEE Infocom Student Poster Session, Mar. 2005.
- P. Kamath, J. Touch, J. Bannister, "[Interference Avoidance in Optical CDMA Networks](#)," (extended abstract), Proc. IEEE Infocom Student Workshop, Mar. 2005.
- J. Touch, Y. Wang, L. Eggert, G. Finn, "[Virtual Internet Architecture](#)," Future Developments of Network Architectures (FDNA) at ACM Sigcomm, August 2003. Available as [ISI-TR-2003-570](#).
- J. Touch, "[An Optically Turbocharged Internet Router](#)," IEEE Workshop on Computer Communications (CCW), Charlottesville, VA, Oct. 2001.
- A. Hughes, J. Touch, "[Expanding the Scope of Prefetching through Inter-Application Cooperation](#)," Web Cache Workshop, Boston, June 2001.
- J. Bannister, S. Suryaputra, J. Touch, A. Willner, "[How Many Wavelengths Do We Really Need in an Optical Backbone Network?](#)" IEEE Gigabit Networking Workshop, NYC, 1999.
- S. Walton, A. Hutton, and J. Touch, "[High Performance IP Forwarding Using Host Interface Peering](#)," (extended abstract) Proc. 9th IEEE Workshop on Local and Metropolitan Area Networks (LANMAN), Banff, Alberta, Canada, May 17-20, 1998 ([slides also available](#)).
- J. Touch, J. Bannister, A. Willner, "[Smart WDM IP Flow Technology \(SWIFT\)](#)," (slides only), IEEE Gigabit Networking Workshop, San Francisco, 1998.
- J. Touch, A. Hutton, S. Walton, "[Host-based Routing Using Peer DMA](#)," (slides only), IEEE Gigabit Networking Workshop, San Francisco, 1998.
- J. Touch, "[Community-of-Interest Driven Multicast Preloading of Web Caches](#)," IEEE Computer Communications Workshop (CCW), Phoenix AZ, Sept. 1997.
- J. Touch, K. Obraczka, A. Hughes, A. Oswal. "[Proactive Web Caches](#)," NLANR Web Cache Workshop, Boulder CO, June 1997. See also [white paper submission](#).
- J. Touch, "[The X-Bone](#)," (white paper), NSF Workshop on Research Directions for the Next-Generation Internet, Vienna, VA, May 13-14, 1997.
- J. Touch, T. Faber, A. Hutton, D. Jani, W. Yue, "[Experiences with a Production Gigabit LAN](#)," (slides only), IEEE Gigabit Networking Workshop, Kobe, Japan, 1997.
- J. Touch, "[Web Transport Requirements](#)," presented at the Web Transport BOF at IETF '96, March, Los Angeles.
- J. Touch, T. Faber, A. DeSchon, A. Sachdev, "[ATOMIC-2: Going the Last Meter for Gigabit LANs](#)," (slides and abstract only), IEEE Gigabit Networking Workshop, San Francisco, CA, 1996.

J. Touch, “[Communication Middleware](#),” (slides only), Presented as a member of the “High Level Communications” panel at the Sigcomm ’95 Middleware Workshop, Boston. Based on the white paper “[Intelligent Bandwidth](#).”

J. Touch, H. Xu, A. DeSchon, T. Faber, “[ATOMIC-2: Production Use of a Gigabit LAN](#),” (slides and abstract only), IEEE Gigabit Networking Workshop, Boston, MA, 1995.

J. Touch, “[Progress on the GBN ’94 ‘Five Challenges That Define High-Speed Protocols’](#),” (slides and abstract only) IEEE Gigabit Networking Workshop, Boston, MA, 1995.

Technical Reports:

S. Suryaputra, J. Touch, J. Bannister, “[The Tetris Switch](#),” USC/ISI Tech. Report ISI-TR-662, Aug. 2009.

J. Bannister, W.-M. Shen, J. Touch, F. Hou, V. Pingali, “[Applied Learning Networks](#),” ISI Technical Report ISI-TR-2007-637, Apr. 2007.

J. Touch, Y. Wang, V. Pingali, “[A Recursive Network Architecture](#),” ISI Technical Report ISI-TR-2006-626, Oct. 2006.

Y. E. Yang, J. Touch, G. Finn, “[The X-Bone API](#),” ISI Technical Report ISI-TR-2005-611, Dec 2005.

N. Fujita, J.D. Touch, V. Pingali, Y. Wang, “[P2P-XBone: A Virtual Network Support for Peer-to-Peer Systems](#),” ISI Technical Report ISI-TR-2005-607, Sept. 2005.

L. Peterson, et al. (eds.), (as member of authoring committee), “[Overcoming Barriers to Disruptive Innovation in Networking](#),” NSF Workshop Report, Jan. 2005.

P. Kamath, J. D. Touch, J. A. Bannister, “Media Access Control Protocols for Communication on an Optical CDMA Physical Layer,” ISI Technical Report ISI-TR-2004-597, Sept 2004.

Y. Wang, J. Touch, J. Silvester, “[A Unified Model for End Point Resolution and Domain Conversion for Multi-Hop, Multi-Layer Communication](#),” ISI Tech. Report ISI-TR-2004-590, June 2004.

J. Touch, “[SIGCOMM Treasurer’s Report](#),” ACM Computer Communications Review, Nov. 2003.

J. Train, J. Touch, L. Eggert, Y. Wang, “[NetFS: Networking through the File System](#),” ISI Tech. Report ISI-TR-2003-575.

J. Touch, Y. Wang, L. Eggert, G. Finn, “[Virtual Internet Architecture](#),” Future Developments of Network Architectures (FDNA) at Sigcomm, August 2003. Available as [ISI-TR-2003-570](#).

P. Kamath, J. Touch, J. Bannister, “[The Need for Media Access Control in Optical CDMA Networks](#),” ISI Tech Report ISI-TR-2003-575, July 2003.

J. Touch, V. Pingali, “[DataRouter: A Network-Layer Service for Application-Layer Forwarding](#),” ISI Tech. Report ISI-TR-2003-578, May 2003.

J. Touch, A. Hughes, Y. Wang, L. Eggert, “[The ISI Summer Graduate Research Experience Program \(SGREP\)](#),” ISI Tech. Report ISI-TR-2002-562, Aug. 2002. (in 2002 Sigcomm Education Workshop).

J. Touch, Y. Wang, L. Eggert, “[Virtual Internets for Lab and Class Experiments](#)” ISI Tech. Report ISI-TR-2002-563, Aug. 2002. (in 2002 Sigcomm Education Workshop).

G. Finn, J., Touch, “[Network Construction and Routing in Geographic Overlays](#),” ISI Technical Report ISI-TR-2002-564, July 2002.

J. Touch, Y. Wang, L. Eggert, “[Virtual Internets](#),” ISI Tech. Report ISI TR 2002-558, July 2002.

Lars Eggert and Joe Touch, "[End-System Support for Idle-Time Networking](#)," ISI Technical Report ISI-TR-559, May 14, 2001.

S. Suryaputra, J. Touch, J. Bannister, "[Simple Wavelength Assignment Protocol](#)," ISI Research Report ISI/RR-99-473, Oct. 26, 1999.

G. Finn, J. Touch, et. al, "[Netstation Architecture and Advanced Atomic Network](#)," ISI Special Report ISI/SR-98-469, Oct. 1998.

J. Touch, J. Heidemann, K. Obraczka, "[Analysis of HTTP Performance](#)," ISI Research Report ISI/RR-98-463, Aug. 1998 (original report dated Aug. 1996).

J. Touch, "[Board for Realizing Active Intelligence in Networks \(BRAIN\)](#)," ISI Research Report ISI/RR-98-462, July 1998 (original report dated May 1997).

J. Touch, "[Multicast web push using interest-groups: the LSAM Proxy Cache \(LPC\)](#)," IPMI Member Newsletter, Aug. 1998, pp. 2-6.

J. Touch, "[PC-ATOMIC](#)," ISI Special Report, ISI/SR-95-407, June 1995.

C. Partridge, Ed., (as member of authoring committee), "[Report of the ARPA/NSF Workshop on Research in Gigabit Networking](#)," Washington DC, July 20-21, 1994.

J. Touch, "[Zoned Analog Personal Teleconferencing \(ZAPT\)](#)," ISI Special Report ISI/SR-94-374, Feb. 1994.

J. Touch, "[Mirage: A Model for Latency in Communication - A Proposal for Dissertation Research](#)," U. Penn. Dept. of Computer & Info. Science (CIS) Technical Report MS-CIS-90-74, DSL-3, Oct. 1990.

J. Touch, D. Farber, "[Replication and Reduction in Multistage Interconnection Networks](#)," Univ. of Penn. Dept. of Computer & Info. Science (CIS) Technical Report MS-CIS-89-80, DSL-2, Dec. 1989.

Invited Panels, Talks, Tutorials:

"[Designing All-Optical Routers and Interfaces](#)," invited presentation at the Conference on Future Internet Technologies, Seoul, S. Korea, June 2011.

"[The Case for Weaker Network Security](#)," invited presentation to the Korean Internet Security Agency (KISA), Seoul, S. Korea, June 2011.

"[Recursive Networking](#)," invited presentation to the Asia Future Internet (AsiaFI) Summer School, Yokohama, Japan, August 2010.

"[Recursion in Networking](#)," invited keynote presentation at the Conference on Future Internet Technologies, Seoul, S. Korea, June 2010.

"[The Past, Present, and Future of Virtual Networks](#)," invited keynote presentation at IEEE FutureNet II Workshop at Globecom, Honolulu, Dec. 2009.

"[The Science of Networking](#)," session chair at IEEE Computer Communications Workshop (CCW), Lenox, MA, Oct. 2009.

"[US Future Internet Research](#)," invited presentation to the ISOC Future Internet Research meeting, IETF Stockholm, July 2009.

"[Recursive Network Architecture](#)," invited presentation to the Future Internet Summer School, Univ. Bremen, July 2009.

“[Recursive Network Architecture](#)” invited presentation in the plenary panel on “Clean Slate Architectures” at Infocom, April 2009, Rio de Janeiro.

“[Recursive Network Architecture](#)” at Network Architecture, Ascona, Switzerland, March 2009.

“[The X-Bone & its Virtual Internet Architecture - 10 Years Later](#)” (presented by Lars Eggert), Workshop on Overlay and Network Virtualization, Kassel, Germany, March 2009.

“[X-Bone + 10: A Decade of International Collaboration](#)” at the NSF US-Japan Collaboration Workshop, Palo Alto, CA Oct. 2008.

“[One Packet Only’ and Other Curiosities: Alternate Axioms that Shake Up the Hourglass,](#)” with J. Day at IEEE Workshop on Computer Communications (CCW), Steamboat Springs, CO, Oct. 2008.

“[The Paper Chase,](#)” at “How to Write a Good Paper” panel at IEEE Infocom 2006 Student Workshop, April 24, 2006.

“[Getting OUT of Grad School,](#)” at “Job Hunting Around the World: Prospects Tips, and Other Advice” panel at IEEE Infocom 2005 Student Workshop, Mar. 14, 2005.

“Virtual and Overlay Networks,” ICNP Tutorial, Berlin, Germany, Oct. 2004; Infocom Tutorial, Miami, Mar. 2005. Available at [IEEE Tutorials Now](#), soon to be released on [IEEE Expert Now](#).

“[Internet Bill of Rights,](#)” Preventing the Internet Meltdown Conf., Westchester, CA, July 27, 2004.

“[Optical Internet Router,](#)” CENIC, Los Angeles, March 16, 2004; Internet-2, Columbus, OH, July 20, 2004.

“Internet & Politics,” USC Annenberg TV News television spot, Nov. 3, 2003.

“[Network Trust Issues,](#)” NSF ANIR Network Trustworthiness panel, Jan. 9-10, 2003.

“[Peer Networks – High Speed Solution or Challenge?](#)” Protocols for High-Speed Networks, Berlin, Germany, Apr. 2002.

“TetherNet & Postel Center,” CENIC, San Diego, May 10, 2001.

“[Peer Nets – reinventing the Internet](#)” OpenArch 2001 Panel, Anchorage, AK, Apr. 2001.

“[E2E YATA \(End2end – yet another talk about\)](#)” Opensig 2000, Napa, CA, Oct. 2000.

“X-Bone demo,” EDUCAUSE/CENIC, Long Beach, CA, Oct. 26, 1999.

“[10 Years of PfHSN - where have we been, where are we going?](#)” IFIP Protocols for High-Speed Networks 1999, Salem, MA, Aug. 1999.

“Summary Report on the Optical Internet Workshop,” 40th IETF (plenary), Wash., D.C., Dec. 1997.

“High-Performance Web,” IFIP Protocols for High-Speed Networks 1996, Sophia-Antipolis, France, Oct. 1996.

“High Level Communications,” ACM Sigcomm 1995 Middleware Workshop, Boston MA, Aug. 1995.

Radio, TV, Newspaper:

“SOPA Legislation and Internet Piracy Solutions,” WMAL FM radio, Patriot Lemonade segment hosted by Kevin Dalton, Jan. 28, 2012.

“ICANN and New Generic TLDs,” CBS Boston FM radio, interview by Mike Epstein and Athony Silba, June 21, 2011.

“Your ‘.brand’ coming soon,” (“ICANN is letting thousands of domain names bloom”), Los Angeles Times, interview by David Sarno, pp. B1 & B4, June 21, 2011.

“Future Internets,” Science & Vie magazine, Vincent Nouryrigat interview, Sept. 2009.

“9/11 Online,” “9/11 Remembrances,” KTLA TV ‘Kurt the Cyberguy’ interviews, Sept. 9 & 11, 2002.

Pending publications

M. Boucadair, J. Touch, P. Levis, R. Penno, “[Analysis of Solution Candidates to Reveal a Host Identifier in Shared Address Deployments](#),” (IETF INTAREA RFC in progress), Feb. 2012.

J. Touch, “[Shared Use of Experimental TCP Options](#),” (IETF TCPM RFC in progress), Jan 2012.

J. Touch, “[Automating the Initial Window in TCP](#),”(RFC in progress), Jan. 2012.

J. Touch, “[Updated Specification of the IPv4 ID Field](#),” (IETF INTAREA RFC in progress), Sept. 2011.

J. Touch, “[Recommendations for Transport Port Uses](#),” (RFC in progress), Jul. 2011.

J. Touch, “[A TCP Authentication Option NAT Extension](#),” (RFC in progress), Mar. 2011.

J. Touch, M. Townsley, “[Tunnels in the Internet Architecture](#),” (IETF INTAREA RFC in progress), Mar. 2010.

R. Penno, S. Raghunath, V. Gurbani,R. Woundy, J. Touch, “[LEDBAT Practices and Recommendations for Managing Multiple Concurrent TCP Connections](#),” (RFC in progress), Feb. 2010.

J. Touch, “[A TCP Option for Port Names](#),” (RFC in progress), Apr. 2006.

A. Hughes, J. Touch, J. Heidemann, “[Issues in TCP Slow-Start Restart After Idle](#),” (RFC in progress).

Ph.D. Students

Amy S. Hughes, “Enhancing Network Object Caches through Cross-Domain Cooperation,” Oct. 2002, USC CS (chair).

Lars René Eggert, “Background Use of Idle Resource Capacity,” Oct. 2003, USC CS (chair).

Puroshutham Kamath, “Media Access Control Protocols for Optical CDMA Networks,” May 2006, USC EE (co-chair w/Joseph Bannister).

Yu-Shun Wang, “A Unified Model for Endpoint Resolution and Domain Conversion for Multi-hop, Multi-layer Communication,” Dec. 2006, USC CE (co-chair w/John Silvester).

Venkata Pingali, “Addressing Uncertainty during Renaming using Space-time Contexts,” Jan. 2009, USC CS (chair).

Areas of Research/Key Contributions and collaborators (*=active)

Network Architecture

- *Satellite network architecture (DynaSat)
- *Recursive network architectures (RNA) (BU, Col. State)
- *Virtual nets via 2-layer tunneling for dynamic routing, IPsec, revisitation, multilayer DDoS protection (X-Bone, DynaBone, Agile Tunnels) (UCL, UMU, KAME)
- *Automation and abstractions for network management (Instant Infrastructure, TetherNet, Turnkey Nets)
- *Application header options to support network layer peer services (DataRouter)
- Geographic networks (GONet) (Finn)
- Network control API as a file system (NetFS) (Eggert, Wang)
- IPsec transport and tunnel mode interactions (Eggert, Wang, Kent, Hagino)
- Application deployment on virtual overlay networks (Wang, Ardaiz)
- Architecture for smart spaces (Personal Node) (Finn)
- Implications of link protocol capabilities on support for Internet protocols (Karn)
- Protocols for optical cut-through switching (Bannister, Suryaputra)
- Configuring end hosts for fault-tolerant routing (Faber)

Protocol Performance:

- *Low-effort/high-performance network security
- *Configurations for high-performance (Faber)
- *Slow-start restart avoidance mechanism (Hughes, Floyd)
- Control block sharing and multiplexing to coordinate parallel connections (Heidemann, Eggert)
- Avoiding TIME-WAIT (Faber)

Network Hardware:

- *Digital optical device design (Willner)
- *Optical router design (Bannister, Kamath, Patel, Hauer, McGeehan, Suryaputra, Willner)
- Peer DMA for high-speed host-based routers (Hutton)
- IP checksum hardware implementation (Parham)
- Performance limits of MD5 authentication hash
- Network interface design (LaCoss)

Web Caching:

- Inter-application sharing for advanced prefetching (Hughes)
- Web performance over TCP (Eggert, Heidemann, Obraczka)
- Self-organizing cache hierarchies and multicast for self-tuning content delivery nets (Hotz, Hughes)

Community Service:

- *Maintain end2end-interest, internet-history, optical-internet email lists
- Developed a tethered tunnel system to simplify DARPA demos (TetherNet) (Wang)
- Codify email and technical sponsorship procedures for IEEE TCGN, ITC, TCCC technical committees
- Codify budget procedures for ACM Sigcomm conference planning
- Codify paper submission, plagiarism, and republication policies for EDAS

ISI Service:

- *Coordinate/maintain the shared Network and Postel Center Labs (X-Bone group)
- *Maintain bagel breakfast web pages, holiday ornament web pages, organize holiday ornaments